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TYPE A BEHAVIOR AND CORONARY ARTERY DISEASE RISK FACTORS IN ADOLESCENTS

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By

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ABSTRACT

TYPE A BEHAVIOR AND CORONARY ARTERY DISEASE RISK FACTORS IN ADOLESCENTS

By Jane Kochka Addington

This study addresses the relationship between Type A behavior and coronary artery disease risk factors in a sample (N = 564) of ethnically diverse high school students. It examines the risk factor behaviors in the sample and their early alignment with the hard driving, aggressive, and hostile behavior known as Type A. In addition, the study provides the initial data on the reliability of the Hunter–Wolf Type A Measurement Tool in the ethnic groups studied.

The study revealed the Hunter–Wolf Tool used to measure Type A behavior had low reliability and did not measure the presence or absence of the behavior pattern in this sample. The wide variation in cultural backgrounds in the students as well as their inability to read or comprehend English well may have contributed to the results. However, ethnicity (significant $t \leq 0.05$, $p \leq 0.05$) and physical activity ($r = 0.10$, $p \leq 0.05$) were found to contribute as risk factors in predicting Type A behavior. This study shows the need to conduct further research on components of Type A behavior incorporating cultural beliefs or behaviors.

TABLE OF CONTENTS

Chapter Page

APPENDIXES (Continued)

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

For nearly 40 years, health care providers have been trying to piece together the information needed to discover, treat, and halt coronary artery disease before it results in myocardial infarction or sudden death. In evaluating coronary disease patients, Dunbar (1942) noted that people with coronary artery disease were, as a group, perfectionistic, aggressive, and competitive. Ever since that observation, behavior and lifestyle have been examined as major contributors in the prevention and treatment of coronary artery disease. The aggressive behavior identified by the physician of the 1940's has been named Type A (Friedman & Rosenman, 1959). Many attempts have been made to define Type A and explore the behavior pattern in individuals. Blood factors have also been implicated in the probability of developing coronary artery disease. These clinical indicators, such as high serum cholesterol, lipids, and triglycerides, were obtained as data in retrospective studies when a myocardial infarction had already occurred.

As the incidence and prevalence of heart disease climbed, both the medical profession and the public demanded to know how to control the progress of the disease before it resulted in pathology. As a result, several longitudinal studies were instituted (Kannell, Castelli, & McNamara, 1967; Jenkins, Rosenman, & Zyzanski, 1968). Basic science and physiology probed the disease at the cellular and tissue level.

Research on coronary artery disease risk factors and behavior types was extended to include both genders, all ethnic groups, and most age groups. Several factors emerged as hallmarks of potential coronary artery disease: (a) male gender, (b) family history of heart disease, (c) cigarette smoking, (d) sedentary lifestyle, and (e) the pattern of hard driving behavior known as Type A (American Heart Association, 1984). Other more disputed factors included a high fat, high cholesterol diet, inappropriate or excessive secretion of sympathetic nervous system agents, and labile blood pressure during stress.

The Problem

The problem explored in this study was the relationship between Type A and Type B behavior and controllable coronary artery disease risk factors in a group of ethnically diverse high school students in a county in northern California. While some of the risk factors cannot be changed or controlled (such as family history or gender), others such as cigarette smoking or a high fat diet lend themselves to lifestyle choices. However, the Type A behavior pattern and its influence on coronary pathology is not as easily defined or modified. Further definition of the behavior and measures for its presence are needed.

As a result, Type A behavior has been described in detail and measured according to specific factors. Relatively little research has addressed the beginning of the Type A behavior. The Type A personality may be innate or learned. If it were possible to estimate when Type A behavior originates, prevention could be aimed at this stage. Controllable risk factors such as smoking could be eliminated to lessen the

chances of coronary artery disease. Therapies could then be designed to treat the disease when it is beginning or when its effects are reversible.

The present study explored the presence of Type A behavior and controllable coronary artery disease risk factors in urban high school students. Results from other studies have indicated the correlation between an early tendency towards a Type A behavior pattern and the combination of lifestyle choices placing a teenager at risk for heart disease.

Purpose and Need

It has been established that there are differences between Type A and Type B persons and controllable coronary artery disease risk factors in middle age (Brand, Rosenman, & Scholtz, 1976). However, only a few studies report this relationship in adolescence (Butensky, Farelli, Hebner, & Waldron, 1976; Hunter, Wolf, Sklov, Webber, Watson & Berenson, 1982). The purpose of this study was to determine whether any controllable coronary artery disease risk factors are associated with Type A or Type B personality during adolescence.

Type A behavior is common in the population of patients with known coronary artery disease. Type A behavior is postulated to evolve sometime between childhood and early adulthood. Bortner and Rosenman (1967) found little evidence of Type A behavior in children under 9 years of age. Herd (1978) discovered behavior differences between Type A and Type B in college students. Since the adolescent population is incompletely measured in either of these two groups, Type A behavior

may be measurable and correlate with controllable coronary artery disease risk factors at the adolescent stage of development.

Controllable risk factors are habits or lifestyles that are formed by personal choice. Ploeger (1986) illustrates that adolescents adopt many adult habits (smoking, exercise, and diet patterns) during adolescence. The present study explored interaction between the presence of emerging adult habits which are coronary artery disease risk factors and a personality type associated with coronary artery disease.

This study focused specifically on the lifestyle aspects of coronary artery disease associated with Type A personality in a multiethnic group of urban high school students. The sample studied represented non-Caucasian subcultures that were not included in previous studies. The age group was limited to 14 to 18 year old adolescents. This combination of age and ethnicity could lead to new information about the relations between certain subcultures and coronary artery disease risk factors as well as the tools used to measure Type A behavior in adolescents.

The significant numbers of Hispanic and Vietnamese students in the study could provide new information on developmental adolescent behavior in cultural groups not necessarily prone to Type A behavior. The Hispanic and Vietnamese subcultures represented different values and in many cases recent entry into the urban American culture. The study explored the effects of assimilation to a possibly stressful new lifestyle. The identification of a relationship between Type A and risk factors in adolescents could form the basis for interventions aimed at lowering risk of coronary artery disease. Comparing the findings for the current population with the population

traditionally studied (Caucasian, male, middle class, middle aged) could yield further insight into Type A behavior.

Research Questions

1. What is the relationship between behavior and smoking in a sample of high school students?

2. What is the relationship between behavior and sedentary lifestyle in a sample of high school students?

3. What is the relationship between behavior and sympathomimetic drug use in a sample of high school students?

4. What is the relationship between behavior and perceived level of stress in a sample of high school students?

5. What is the relationship between behavior and above average weight for height in a sample of high school students?

Definition of Terms

Conceptual Definitions

1. Type A behavior is an action emotion state seen in individuals who possess a chronic and incessant urge to accomplish more things in a given time, engage in high levels of sympathetic nervous system induced activity, and possess a free floating hostility.

2. Type B behavior is the relative absence of Type A characteristics. Examples of Type B behavior would include slow speech and eating patterns, less time urgency, and the ability to ponder and reflect.

3. Controllable coronary artery disease risk factors are nonhereditary risk factors which are the result of personal choice or voluntary individual attitudes. Examples are smoking, sedentary lifestyle, and drug use.

4. Coronary prone behavior pattern is the combination of Type A personality and the presence of controllable coronary artery disease risk factors.

Operational Definitions

1. Type A personalities include individuals scoring in the top 20th percentile on the Hunter–Wolf Type A Measurement Tool.

2. Type B personalities include individuals scoring in the lower 20th percentile of the Hunter–Wolf Type A Measurement Tool.

3. Adolescents were persons in the period between childhood and early adulthood, ages 14–18. In this study high school students represented adolescents.

4. Controllable coronary artery disease risk factors were operationalized as follows:

a. Smokers were students who smoked at least two cigarettes more than two times a week.

b. Sedentary lifestyle was defined as follows: For students enrolled in physical education classes, those who dressed for class less than three times a week were considered sedentary. For students not enrolled in physical education classes, those who engaged in aerobic activity three times a week or more were considered active, with all others considered sedentary.

c. A high perceived stress level was defined as a stress level experienced by students who considered both their family and school life moderately stressful or more than moderately stressful.

d. Sympathomimetic drug use was defined as the use of drugs that mimic the activity of the sympathetic nervous system (for example, cocaine or amphetamines) once a week or more.

e. A high fat diet was determined by the student's weight and height. Height and weight were compared to the Metropolitan Life Insurance charts, with those students measuring over 120% of recommended weight for height considered as having a high-fat diet.

These controllable risk factors were compiled using a Risk Factor Questionnaire. The Type A behaviors were delineated by the Hunter-Wolf Tool for measuring Type A behavior.

Assumptions

The assumptions that apply to this study related to the concept of Type A and Type B behaviors. The researcher first assumed that Type A was a discrete entity and was different from any other group of behaviors. The second assumption concerns Type B behavior which has not been defined as a separate entity. Instead, Type B is considered the opposite of Type A. The hidden inference in any study of Type A and Type B as opposites is that an individual with Type B behavior is less at risk for heart disease than Type A. There are no data to support the conclusion that Type B behavior is helpful versus harmful. Thus, the students in this study with Type B

behavior may also be at risk for coronary artery disease through a different set of risk factor combinations such as genetic or other behavioral traits. Type B behavior when combined with cultural dietary or exercise practices might constitute a separate risk combination for heart disease.

Other notions underlying the study concern the nature of controllable coronary artery disease risk factors. It may not be that a compendium of lifestyle characteristics can predict coronary artery disease. Rather, it is possible that someone with all of the controllable risk factors for coronary artery disease will develop the disease, while someone with only one or two of the risk factors will not. However, failure to develop coronary artery disease despite lifestyle choices was also a possible outcome.

The last conceptual assumption involved a combination of the two entities of behavior type and controllable coronary artery disease risk factors. There is evidence that the behaviors composing the Type A personality are unique effectors in coronary artery disease and that personality type has little correlation to the risk factors such as smoking (Brand et al., 1976). However, this evidence comes from studies on populations of adults. As a result, the research questions in the current study were based on the assumption that lifestyle factors might align themselves with behavior type in adolescents, thereby placing a person at early risk for heart disease.

Research Design

The study was descriptive correlational research. No control group was used and no variables were manipulated. For the purposes of regression analyses, the dependent variable was behavior type (A or B), and the independent variables were the various

controllable coronary artery disease risk factors: smoking, perceived stress, drug use, sedentary lifestyle, and increased weight for height. Following a listwise deletion of missing data, Pearson's Product-Moment Coefficients of Correlation were used to determine correlation between the dependent and independent variables. Multiple regression was calculated to determine which independent variables as well as between best predict overall Hunter-Wolf score. The r^2 statistic was used to determine the ability of the variables to account for variance in the overall score on the Hunter-Wolf Tool. Beta weights indicated which independent variables were weighted heavily in predicting the overall score on the Hunter-Wolf Tool.

Setting and Sample

The study was conducted at an ethnically diverse school in northern California. The sample population consisted of students in grades 9 through 12 enrolled in basic and advanced biology classes. Subjects signed a consent form declaring their understanding of anonymity, and that the research would be used as part of completing a Master's thesis (Appendix A). The students were instructed that they were not obligated to complete the study if they felt uncomfortable. They were also informed that the results from the study might be used to help produce education programs for other adolescents.

Data Collection and Analysis

The subjects completed two research tools: the Hunter-Wolf Type A Measurement Tool (HWT), found in Appendix B, and the Risk Factor Questionnaire (RFQ), found in Appendix C. As stated in the operational definitions, those in the top

20% of scoring on the HWT were considered Type A, with the lowest 20% being considered Type B. This method of categorizing the two types was identical to that used by Hunter et al. (1982). Immediately following completion of the HWT, the subjects completed the RFQ about controllable coronary artery disease risk factors. Age and ethnicity questions were included in this questionnaire. The use of a health habits questionnaire in this study made it different from the original studies done by Hunter et al. (1982) in that the present study did not include physiologic measurement tools to determine risk factors. The present study used the health habits questionnaire instead of physiologic measurement tools to determine risk factors. Both the HWT and the RFQ were administered by classroom instructors giving instructions from a prepared script that stressed that responses were confidential. A detailed list of synonyms for both tools was available for science teachers administering the study to clarify terms on the forms for the students.

Scope and Limitations

Logistics and expenses narrowed the focus of the research. The study attempted to illustrate differences between the way Type A or Type B behavior affect lifestyle choices or possibly influence future coronary artery disease. Many other factors contribute to the likelihood of developing coronary artery disease, among them heredity and preexisting disease processes. The study did not attempt to explain these influences. Only nonphysiologic indicators of potential coronary artery disease were used. Measurements such as serum lipids, cholesterol and triglycerides, pulse, blood

pressure, galvanic skin response, stair stepping tests, and triceps skin fold thickness could yield precise data to illustrate a physiological difference between Type A and Type B, but were not done due to limits in resources, and the logistical problems of obtaining parental consent for physiological testing of minor children.

The sample size and generalizability of results were limited by the constraints of using one high school. The sample is one of relative convenience and the ethnicity of the sample is not parallel to the general population. The questionnaires were administered late in December when the subjects were anticipating the Christmas holiday. The context of imminent vacation may have an effect on the results of the study.

The reading skills of the sample population were well below average for their age group, thereby affecting their test taking skills (K. Lyter, personal communication, January, 1985). Inappropriate answers were frequent in previous American Heart Association questionnaires used with multi ethnic urban students (American Heart Association, 1984). Multiple choice questions were used to limit the potential for unusable written information. Conflicting or irrelevant multiple choice answers were present in approximately 5% of the returned questionnaires. The brief time allotted for explanation of the study, obtaining consent, and completing the questionnaires (30 minutes) compounded the problem of comprehension for subjects with poor reading skills or with English as a second language.

The choice of measurement tools further illustrates limitations of the study. Several techniques have been shown to have high levels of validity and reliability in

determining Type A behavior. Among these tools are the Jenkins Activity Survey (Jenkins, Rosenman, & Friedman, 1967), a structured interview, and the Matthews Youth Test for Health (Matthews & Angulo, 1980). Again, the lack of staff and resources dictated the use of printed questionnaires. While the HWT is adequately tested for reliability and validity and geared for the age group under study, it may be less ideal than the previously mentioned techniques. The other tool, RFQ, was created by the investigator for use in American Heart Association blood pressure information programs in high schools. After pilot testing on a group of 25 students at the high school, the tool was modified by science teachers and a cardiologist to establish content validity.

The researcher's experience and perceptions may also have caused bias. The incentive for the study stemmed from the researcher's involvement with the American Heart Association's blood pressure screening programs in area high schools. The RFQ was created not only for the study, but to be used in conjunction with blood pressure screening units in several county high schools. Although these questionnaires had never been formally analyzed, higher percentages of Black and Hispanic male high school students demonstrated elevated blood pressures than other groups in the sample (American Heart Association, 1990). The researcher had extensive exposure to the attitudes about health and heart disease held by the study population. Cultural beliefs concerning diet, exercise, and preventative medicine were expressed by certain ethnic groups within the study: "Women don't exercise until they sweat," "All my uncles have it, so I'll have it, too." The researcher's bias was that these adolescents had

started making the lifestyle decisions that would affect the rest of their adult lives and that coronary prone behaviors would be present in the group studied.

Chapter 2

CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURE

Friedman Theory of Type A Behavior

Type A behavior and its accompanying lifestyle factors were initially described by Friedman and Rosenman (1959), Friedman, Rosenman, and Byers (1964), and Rosenman, Brand, Jenkins, Friedman, Straus, and Wurm (1975). These earliest descriptions focus on intrapsychic or personal attributes. Later research (American Heart Association, 1984) outlined environmental components that may aggravate or alleviate Type A reactions. The interaction between innate personality and the perception of the environment has been cited as the most effective explanation of the Type A pattern (Jenkins, Rosenman, & Cleveland, 1971).

The framework in this study utilized Friedman's personality profile of Type A and correlated it with Lazarus' (1984) theory of coping. In this way, Type A behavior and controllable coronary artery disease risk factors may be seen as part of an adaptation or transaction involving the self, its appraisals of the environment, and the resources used for coping in daily life.

Friedman and Rosenman (1959) first described Type A behavior as characterized by time urgency, excessive competitive drive, and an easily aroused hostility. Friedman, Byers, Diamant, and Rosenman (1975) further demonstrated that Type A behavior is associated with serum abnormalities which are precursors of coronary artery disease. The Western Medical Group Study (Friedman et al., 1964; Rosenman,

Brand, et al., 1964; Rosenman, Friedman, et al., 1964) reaffirmed this association by retrospectively correlating subjects with acute coronary artery disease manifestations to their previously determined behavior type. Lazarus' (1984) theory of coping and stress supports the Friedman and Rosenman (1959) and Friedman (1978) description of Type A behavior. Friedman's focus was on the medical linkage of certain personality traits to heart disease. When Friedman described in detail the personality traits of Type A, they were related to components of Lazarus' (1984) coping strategies. Four components of Type A behavior were delineated. These components related directly to the Lazarus coping model (1984) and will be explained individually.

An overwhelmingly obvious trait of the Type A person is a habitual sense of hurry. The Type A person strives to accomplish or participate in too many events per time period allotted. Multiple deadlines or performance challenges are created, leading to a continuous time pressure. This unrealistic number of tasks leads to a preoccupation with doing things faster. Speed becomes valued over quality or creativity, thus effecting stereotyped but efficient responses to challenges. When situations arise that demand alternate approaches, the Type A individual may literally run through many hasty solutions but emerge with little or no benefit for the effort expended (Friedman, 1978).

The next two identifying traits of the Type A behavior pattern are related. Type A persons are obsessed by numbers of accomplishments, income, and material possessions. However, the attainment of the tokens of success is all important. As a result, somewhere in the Type A development process the individual begins to

measure the value of his person by the number of his achievements. The tendency to link acquisition with self–worth is the third trait of the Type A person. Thus, achievements must constantly increase to satisfy not only individuals, but their peer groups, whom they see as judging them in the same way. A conflict arises if the Type A attempts to collect a maximum number of achievements in minimal time. Lack of success or encountering difficulties jeopardized the Type A person's view of self (Friedman, 1978).

Type A behavior is characterized further by an aggressive drive that frequently evolves into hostility. The primary indicator of this trait in Type A persons is the competitive tendency when challenged by people, sporting contests, games, or discussion. When a Type A person perceives people or events blocking the attainment of a goal, the Type A attacks the perceived blockade (Friedman, 1978). Type A persons see coworkers as competitors for achievement and, instead of facing inner shortcomings, project anger or blame. Logistical problems, such as long lines or traffic jams, arouse anger in a Type A person because they are seen as wasting valuable time; the time that could be used to meet one of Type A's many deadlines.

Lazarus Theory of Coping/Stress

Lazarus (1984) summarizes some of the transactions between persons and environment that are responses to stress. Although Type A behavior is considered innate and not a reaction to a particular stress, it does predispose individuals to typical coping responses. The initial cognitive, or primary, appraisal is an evaluation of the event in a personal framework. The situation is placed in a category based on

previous life events that relate to well being. At this stage, the individual (consciously or unconsciously) categorizes the situation as benign, irrelevant, or one of three stressful relationships. Lazarus describes these three stress relationships that tax an individual's adaptive resources as: (a) harm-loss, (b) threat, and (c) challenge. Harm-loss is a situation where damage has already occurred. Threat occurs when an individual anticipates harm or loss. Challenges are similar to threats, but concurrent with a potential harm is a potential gain. Both cognitive and active coping processes are involved in an adaptive response to one of the three stress relationships. The secondary appraisal further defines the types of coping tasks and efforts necessary to deal with a situation.

As shown in Figure 1, secondary appraisals (coping strategies) can be directed towards either internalization (defense mechanism) or activity (direct action or information seeking). The intrapsychic mode is an effort to regulate either a way of thinking, develop control of emotions, or both.

Lazarus (1984) postulates that disease is the price of mobilizing to cope with perceived stressors. He further speculates that people's coping mechanisms are neither conscious, rational, or adaptive, but that beliefs are perceptions affecting the choices of coping modes.

The Type A personality fits well into Lazarus' description of stressful relationships as a lifestyle rather than an isolated event. The Type A person constantly views life events as challenges. To succeed or gain from the situation promotes a

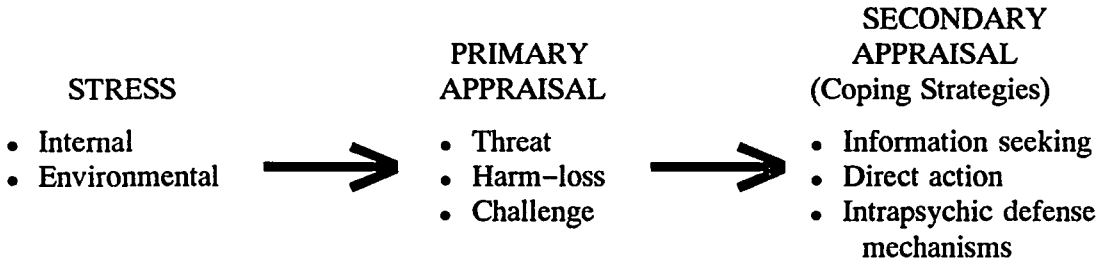

Figure 1. Interpretation of coping process defined by Lazarus

frenzied aggressive series of events. Not succeeding is a continual threat, and hostility towards that which prevents success is inevitable. Most of the Type A coping tasks are direct actions to manage internal demands. Direct actions are vital to Type A because they are measurable (money, academic degrees, sports achievements). Type A individuals may believe that others demand their extreme performance, but this fallacy is based on their own need for peers' and superiors' approval. Although Type A persons are expected to maintain standards of performance like anyone else, their internal expectation to exceed the norm or to exceed it quickly promotes environmentally oriented goals (Friedman, 1978).

The illness state of coronary artery disease relates to the Lazarus (1984) model. Type A persons are deficient in their intrapsychic coping mechanisms. Activities such as reflections, reverie, and leisurely pondering are foreign to them. Type A persons are unable to admit problems and ask for help. Most importantly, they have lost the ability to gauge their own worth internally, and rely on tokens of external achievement to satisfy them. They hasten to accumulate more and more in less and less time with decreasing security.

Heart disease may be a result of the Type A coping pattern. It is difficult to effectively change values and beliefs that influence coping. However, it is necessary to generate a more fruitful way of coping if the modern epidemic of heart disease is to be halted.

Literature Review

There is extensive research on coronary artery disease. Prominent studies relevant to this research problem will be reviewed.

As explained in the problem statement, the etiology of coronary artery disease is complex and multifaceted. Many researchers interpreted the roles of serum cholesterol, blood pressure, smoking, obesity, and sedentary lifestyle as central to the risk for clinical disease (Kannell et al., 1967; Stamler, 1975; American Heart Association, 1984). In addition, personality characteristics appeared to significantly increase the susceptibility of an individual to coronary artery disease (Friedman & Rosenman, 1959; Hayes, Levine, Scotch, Feinleib, & Kannell, 1978; Frank, Heller, Kornfeld, Sporn, & Weiss, 1978; Jenkins, 1976; Rosenman, Brand, Sholtz, 1976; Rosenman et al., 1964). The above mentioned risk factors have been confirmed as contributing to coronary artery disease.

As early as the late 1950's, Friedman and Rosenman (1959) conceptualized the personality and behavior of coronary patients that had been described earlier by Dunbar (1942) and Arlow (1945). They portrayed the Type A individual as "characterized by excessive competitive drive, a persistent desire for recognition and advancement, a persistent involvement in multiple deadlines and a propensity to accelerate the pace of living" (Friedman & Rosenman, 1959). Two later studies (Brand et al., 1976; Rosenman et al., 1975) used multiple logistic analyses to identify a 31% excess risk for Type A men versus any other personality type of comparable demographic or physical description. Type A behavior was found to make an

independent contribution to coronary artery disease in adult men (Rosenman et al., 1975).

After establishing the existence of Type A behavior and describing its relative risk in relation to coronary artery disease, the focus turned to measuring the behavior type. The three most common testing methods are described. Critiques offered by various disciplines are mentioned following the descriptions.

1. The Rosenman Structured Interview (RSI) is a challenge situation in which assessment is based primarily on the voice style and psychomotor mechanisms or the interviewee, as well as the verbal answers given.

2. The Jenkins Activity Survey (JAS) is a self-administered questionnaire with five subscales for various factors of Type A behavior (e.g., Speed-Impatience). The two methods agree in rating an individual as Type A or Type B from 65% to 73% in some studies, with 90% at extreme ranges (Dembroski, 1978).

3. The Bortner Battery is a series of four performance tasks. Each task is theoretically linked to an aspect of Type A behavior. This method agrees with the RSI (Dembroski, 1978), but is considered less reliable because it is short, has no component measuring verbal ability, and uses tasks devoid of social desirability [postulated to effect competitive response] (Bortner & Rosenman, 1967).

With adult subjects, the RSI and JAS are the preferred research tools for measuring Type A behavior. Reliability and validity as well as subject scores in relation to heart disease are published by Zyzanski, Jenkins, Ryan, Flessas, & Everist (1976), or Kittel, Kornitz, Zyzanski, Jenkins, Rustin, & Degre (1978). There is ample

evidence of the relationship between Type A behavior and coronary artery disease in adults, specifically males 40–60 years old (Blumenthal, Kong, & Rosenman, 1978; Blumenthal, Williams, Kong, Schanberg, & Thomas, 1978; Frank et al., 1978; Jenkins, Rosenman, & Zyzanski, 1973; Williams, Haney, Lee, Kong, Blumenthal, & Whalen, 1980).

This research study was concerned with the genesis of Type A behavior and associated coronary artery disease risk factors in adolescents. It is recognized that coronary artery disease probably begins in late childhood (Berenson et al., 1980). Neither coronary risk factors nor Type A behavior were discovered in young children in Bortner, Rosenman, and Friedman's (1970) study of intrafamily coronary behavior patterns. On the other side of adolescence, college students have shown labile Type A behavior related to examinations or other academic stressors (Burnham, Pennebaker, & Glass, 1975). Neurochemical studies indicate that Type A college students have different physiologic reactions to time pressure and exams than their non–Type A counterparts (Dembroski, MacDougall, Shields, Pettitte, & Lushene, 1977; Herd, 1978).

Butensky et al. (1976) concluded from their study on rural and suburban students (ages 11, 13, and 15) that Type A behavior and lifestyle patterns may increase during adolescence. Butensky et al. (1976) postulate that environment may influence the personality development of Type A. The present study investigated ethnic groups different from those previously studied. Cultural values may influence Type A behavior and lifestyle risk factors.

Realizing that coronary artery disease may present itself in late childhood or early adolescence, it became vital to be able to assess the presence of personality factors as contributing to coronary artery disease (Hall, 1982). One assessment tool for Type A behavior in children is the Matthews Youth Test for Health (MYTH). It contains 17 rating scales (competitiveness, impatience, etc.) and is completed by classroom teachers. The MYTH has been validated by using laboratory measures indicative of Type A (e.g., increases in sympathetic nervous system chemical release) and by scoring systems for Type A characteristics (Matthews & Angulo, 1980). The advantages are objectivity and effectiveness for those under 9 years of age, who do not answer questionnaires or interview questions consistently.

Another measure of Type A, which was used in this study, can be completed by children: The Hunter-Wolf Type A Measurement Tool (HWT). The test consists of 24 bipolar statements ("I eat fast, I eat slowly"). Subjects place themselves numerically between the statements. This Type A scale has interrelated reliability with other psychosocial measures (Wolf, Hunter, & Webber, 1979; Wolf, Hunter, Webber, & Berenson, 1981). The HWT has been used with adolescents because of its simple language and the close approximation of its scales to both the Jenkins Activity Survey and the Rosenman Structured Interview.

Siegel, Matthews, and Leitch (1983) and Hunter et al. (1982) expanded their study of Type A behavior to include physiologic indicators of potential coronary artery disease. Siegel et al. (1983) correlated Type A behavior to blood pressure variability. Hunter et al. obtained a variety of biochemical indicators (serum total cholesterol,

triglycerides, and lipoproteins), as well as blood pressure to correlate with Type A or Type B behaviors.

Siegal et al. (1983) used 211 adolescents, ages 13–18, from 14 sites in Washington state. The Rosenman Interview was administered. A single blood pressure was measured, and demographic data recorded. Eight months later, blood pressure was measured three times in one day by qualified health care providers. Systolic blood pressure variability yielded a main effect for behavior type ($p<.05$). Paired comparisons between Type A and Type B showed significant differences at the $p<.05$ level. Type A students exhibited higher peak systolic and diastolic blood pressures, but the introduction of weight as a covariate rendered the findings nonsignificant.

Siegel et al. (1983) concluded that high blood pressure variability is a function of Type A behavior after introducing statistical controls to eliminate artifacts of regression towards the mean. This result is only arguable on the grounds of methodology. The measurement of blood pressures 8 months apart did not form a sufficient basis for functional variability. Since the last three blood pressures were taken within 30 minutes, they may not accurately represent blood pressure variations over time.

Hunter et al. (1982) classified 406 rural subjects, ages 7–17, as Type A or Type B, using their Self–Assessment Questionnaire. Physiologic parameters were measured in a standardized laboratory. The tool measured four factors: (a) eagergy [sic] eagerness and energy, (b) restlessness, (c) involved/serious, and (d) hurried.

Results were significant only for the eagergy (eagerness and energy) category. Serum total cholesterol ($p = .020$), beta and pre-beta lipoprotein cholesterol ($p = .016$, $p = .016$), and triglycerides ($p = .020$) were markedly different between Type A and Type B. Many other data permutations were introduced. Conclusions indicated that further research of the same nature was necessary to identify dependent and independent predictors of coronary artery disease. The Hunter study methodology was satisfactory, but, as in the current study, the setting (rural Louisiana) limited the ability to generalize to the larger population. The age group used (7-17) made it difficult to generalize to either children or adolescents.

Recent studies indicate a relationship between Type A behavior in children and psychophysiological responses to stress. Woodall and Matthews (1989) found that when families were less supportive or negatively involved with children, the children scored high on measurements of hostility and anger. Male children exhibited a heightened heart rate response to competitive tasks when their family profile indicated authoritarianism and negative involvement with the child. In this study, Type A behavior was associated with cardiovascular responses to stress and scores on two measures of family involvement.

Matthews et al. (1988) measured physiologic responses to both isometric exercises and competitive tasks in sets of parents and their children. Analyses showed significant parent offspring and sibling associations in resting blood pressures and body mass. Only siblings showed similar physiologic responses to certain competitive tasks and to isometric exercises. Parents and siblings showed similar responses to

isometric exercise only when strict controls were imposed on diet prior to testing to eliminate the influences of caffeine, nicotine, or alcohol. The lack of significant association between parent's and children's responses to competitive or stressful tasks implies that non-familiar influences are more important in determining psychophysiological responses to stressors.

The smoking behaviors, alcohol use, and oral contraceptive use of Type A children were described by Johnson, Hunter, Amos, Elder, and Berenson (1989) using the same type of rural student population studied in their earlier research. The HWT was used to determine Type A behavior and a health habits questionnaire measured use of substances. The strongest associations were found between smoking and hostility and between hostility and drinking for Caucasian males. Onset of menses in females correlated with increase in the drive component of Type A behavior.

Summary of Literature Review

This study was based on the original concept of Type A behavior as developed by Rosenman and Friedman (1959). The pathophysiology underlying the early natural history of coronary artery disease in children or adolescents is not clearly understood. However, identifying behaviors, lifestyles, or personality factors that indicate risk or protection from disease at an earlier age could lead to the design of intervention programs for children and teenagers. Programs of intervention have already been investigated in adults (Suinn, 1978).

More research needs to be done correlating laboratory analyses and risk factors. The process for defining and measuring the problem of coronary artery disease risk

factors, including behavior types, is being perfected in adults and is being extended to include teenagers and children. The HWT was selected for this study because the language was appropriate for the age group and it was easily completed in a short time period. The various interview methods were not selected due to the time needed to complete the interviews and the size of the sample. The JAS was not selected for the study because the scales in the survey used language about job performance and traffic patterns, which were inappropriate for the sample.

Chapter 3

METHOD

The design of this study was descriptive and correlational. The research design was similar to that of Hunter et al. (1982), in which Type A behavior was designated using a tool and aligned with clinical laboratory factors for heart disease.

Setting

The questionnaire completion took place at a high school in northern California in two science classrooms. The high school principal and all interested science instructors granted approval for the study as part of the annual hypertension and heart disease clinic (Appendix D). The authors of the Hunter–Wolf Type A Measurement Tool (HWT) granted permission for its use (Appendix E). The Committee for the Protection of Human Subjects at San Jose State University approved the study (Appendix F). The Risk Factor Questionnaire (RFQ) was already in use by The American Heart Association as part of a high school blood pressure program. Members of the high school science faculty were helpful in simplifying some of the language in the RFQ. They also arranged the physical setup for questionnaire administration by manipulating student schedules and coordinating classroom seating. Freshmen and sophomores were seated at desks, while most junior and senior students were at laboratory tables. Class size during questionnaire administration ranged from 12 to 40. The students' usual science teacher introduced, administered, and proctored the survey process.

Sample

The sample population consisted of 564 students from grades 9 through 12 enrolled in basic and advanced biology classes. Forty-three percent of all biology students participated in the study. The science teachers attempted to administer the questionnaires equally to grades 9 through 12, with the same number of students in each age group. Freshmen and sophomores in the population were enrolled in required basic science courses, whereas juniors and seniors were predominantly enrolled in elective science courses. Table 1 shows the age of the students in the sample, and Table 2 shows the ethnicity of the sample. Table 1 indicates that ages 14 through 18 were evenly represented in the sample. Table 2 indicates that 31% of the sample were of Hispanic ethnicity. Caucasian, Vietnamese, Indichonese, and Black students were equally represented in the sample at 12–18% for each group.

Tools

Students completed two tools. The HWT consisted of students rating their own behaviors on 24 questions using a seven-point Likert scale. After finishing the Type A measurement tool, students completed the RFQ. In the present study, behavior type (A or B) was aligned with controllable risk factors for heart disease by comparing the Type A students' risk factors with the Type B students' risk factors.

The HWT was discussed in Chapter 2 under Literature Review. Subjects ranked themselves on 24 questions with descriptors of recognized Type A or Type B behavior at the opposite ends of a 7 point Likert scale in the shape of a ladder (example: "I am always in a hurry. I am seldom in a hurry.") (see Appendix B). On some of the

Table 1

Composition of Sample by Age (N = 564)

Age	n	%
14	133	24
15	153	27
16	116	21
17	103	18
18	41	7
over 18	13	2
No response	5	.9

Table 2

Composition of Sample by Ethnicity (N = 564)

Ethnic Group	n	%
Hispanic	174	31
Caucasian	101	18
Vietnamese	88	16
Indochinese	85	15
Black	68	12
Native American	19	3
No response	27	5

scales, a score of "7" described a Type A behavior, while on other scales a "7" described Type B behavior. During scoring, appropriate scale values were reversed so that high overall scores would indicate Type A behavior. Wolf, Hunter, and Weber correlated the HWT with other measures of Type A components. Three psychosocial measures (self-concept, locus of control, and goal blockage) were tested. All of these traits are components of personality risk factors in cardiovascular disease (Neufeld & Davison, 1973; Neufeld, 1974). Six tasks were created to validate the behaviors described on the HWT. Four-way multivariate analysis of variance was computed for nine out of ten of the tasks. For each of the tasks, Type A children behaved in the predicted direction (i.e., eating faster, talking louder, winning competitive games) at the $p < .05$ significance level, and in many cases at $p < .005$. A reliability correlation coefficient of $r = .59$ indicated that the tool had sufficient reliability for research purposes and could be employed in association with other coronary artery disease risk factors in research.

The Risk Factor Questionnaire (RFQ) had been used previously by the American Heart Association for blood pressure screening programs. Using a question stem and multiple answer format, subjects state their age, gender, height, weight, nonprescription drug use, physical activity schedule, smoking frequency, family cardiovascular history, and perception of home and school stress. The entire answer option was circled instead of a letter prefix. The questionnaire was modified by the researcher in conjunction with a statistician to assign coding values to each potential response. A

cardiologist associated with the high school blood pressure project approved the questionnaire for continued use as a survey tool for the American Heart Association.

The tool was pilot tested by selected students from the potential sample population. Changes were made to reflect required attendance in physical education for 9th and 10th graders and to include vocabulary common to the sample population (e.g., "uppers" vs. amphetamines). Retesting indicated that subjects were able to comprehend what was asked and complete the questionnaire in 10 minutes. Reliability and validity studies were not performed because the RFQ was a survey rather than a measure of traits. The American Heart Association encouraged the researcher to use the questionnaire in order that the tool could be further modified for increased reliability.

The RFQ was scored by assigning number values to responses for purposes of coding and identification in the formatting of various statistical packages. For example, a high stress level was assigned a "3" code, while a moderate stress level was assigned a "2" code. Numerical values did not reflect increasing or decreasing risk for coronary artery disease.

Procedure

Two weeks before questionnaire administration, the researcher met twice with all science instructors who would be administering the tools. The research protocol was presented and reviewed. Instructors read the scripts introducing the study to the students. Scripts included the text of the two tools, detailed synonym lists, and consent forms. The documents were evaluated for clarity. At this time the instructors

determined that the students would be less distracted if the researcher was not present during the questionnaire administration. The questionnaires were administered on December 22, 1984 and on January 3, 1985. During both days, the students were on a shortened daily schedule which allowed them 30 minutes to complete the tools.

The science teachers read or paraphrased a prepared instruction sheet to the students. After the study had been introduced, consents were signed and returned (Appendix A). The tools were administered by the instructors, who used a prepared script that stressed subject anonymity (Appendix G). Each item on the HWT was read aloud. Teachers could read the RFQ aloud at their discretion. Students were encouraged to raise their hands if they did not understand a question or a word. Synonym lists were used to translate unfamiliar words of phrases (Appendix H). Instructors paraphrased for the student if synonyms were not helpful. Completed questionnaires were deposited in sealed boxes so instructors had no contact with them. The boxes were collected by the researcher on the day of questionnaire administration.

Chapter 4

ANALYSIS AND INTERPRETATION OF DATA

All collected data were analyzed to determine mean score and standard deviation for each of the questions using a 7-point Likert scale (referred to as a ladder) on the HWT. The maximum possible score on the HWT was 161, with a minimum of 23. Table 3 reports the mean and standard deviation for each of the 23 questions.

The mean scores for Items 5 (fighting behavior) and 13 (interests) were higher than 5 on the scale of 7. These scores indicated that the students engaged in fighting and had many interests. For the sample, interests could refer to extracurricular activities, gang participation, cultural groups, or English classes in the evenings. These mean scores were also higher than the mean scores in the first Hunter et al. (1982) study for the two items, indicating that the current sample engaged in fighting more and had more interests than that sample. In this sample, fighting and having many interests (both Type A behaviors) may have been culturally more acceptable and not necessarily indicators of Type A behavior. Timeliness (Item 9) had a low mean score of 2.619, indicating that the sample did not feel it was important to be on time. The values of the subcultures represented in the sample may have had more impact on this response than the tendency of the group as a whole towards Type B behavior.

Table 4 indicates the distribution of responses on the RFQ. There was a family history of coronary artery disease in 71% (n = 391) of respondents. Twenty percent

Table 3

Means and Standard Deviation for Ladder Scores for HWT (N = 564)

Ladder	Description	Mean (1-7)	Standard Deviation
1	Drinking speed	3.975	1.455
2	Disposition	3.679	1.565
3	Argument	4.500	1.889
4	Thinking behavior	3.560	1.844
5	Fighting behavior	5.297[a]	1.789
6	Hurriedness	3.759	1.608
7	Authoritative	4.186	1.737
8	Time passage	3.419	1.747
9	Timeliness	2.619[b]	1.917
10	Hobbies	3.849	2.155
11	Patience behavior	3.215	1.708
12	Talking speed	4.323	1.431
13	Interests	5.591[a]	1.581
14	Walking speed	3.475	1.623
15	Talking volume	3.987	1.529
16	Leadership	4.259	1.724
17	Eating speed	4.301	1.614
18	Listening	4.667	1.624
19	Goal frustration	3.504	1.555
20	Competitive behavior	3.458	1.767
21	Anger threshold	4.077	1.867
22	Temper threshold	3.923	1.851
23	Degree of effort	4.587	1.639

[a]High.
[b]Low.

Table 4

Risk Factor Questionnaire Responses (N = 564)

Description	Value Label	Code No.	Frequency of Responses	Valid %
Age	14	1	133	23.8
	15	2	153	27.4
	16	3	116	20.8
	17	4	103	18.4
	18	5	41	7.3
	Over 18	6	13	2.3
Gender	Male	1	277	49.8
	Female	2	278	50.0
Ethnicity	Caucasian	1	101	18.9
	Hispanic	2	174	32.5
	Black	3	68	12.7
	Indochinese	4	85	16.4
	Vietnamese	5	88	16.4
	American Indian	6	19	3.6
Family coronary artery disease	Yes	1	391	70.9
	No	2	165	29.6
Sympathomimetic drug use	Yes	1	112	20.1
	No	2	444	79.9
Physical activity	Yes	1	447	81.9
	No	2	99	18.1
Smoking behavior	Never	1	446	86.6
	More than 2x/week	2	25	4.9
	Less than 2x/week	3	44	8.5
Height/weight	Over 120% weight for height	1	24	12.7
	Between 100 & 120% weight for height	2	165	30
	100% or below weight for height	3	375	57.3
Family stress level	Very high	1	43	8.0
	High	2	125	23.0
	Moderate	3	221	40.9
	Little	4	115	21.3
	None	5	37	6.9
School stress level	Very high	1	38	7.0
	High	2	127	23.5
	Moderate	3	208	38.5
	Little	4	137	25.4
	None	5	30	5.6

(n = 112) of the students used drugs that mimic the sympathetic nervous system on a weekly basis. Most of the students in the sample (n = 446, 87%) had never smoked. Only 13% of the students (n = 24) were clinically obese (over 120% of weight for height). There were 18% (n = 99) of the students who engaged in no physical activity. The perceived level of school of home stresses fell within a normal distribution pattern. The information in Table 4 indicates that adolescents in the sample were engaging in behaviors, such as sympathomimetic drug use, which do have an impact on coronary artery disease.

In calculating reliability scores for the HWT, any subject with missing responses on the scale was eliminated from the data pool. As a result, the number of respondents actually used in reliability analysis was 447. A correlation matrix and Crohnbach's alpha were determined for 23 of the 24 items on the HWT. Item 22 was eliminated and not completed by study participants because it referred to "jobs." The reliability coefficient for the sample was low, at 0.46, and the standardized item alpha was also 0.46.

In the original study done by Hunter et al. (1982), all students whose native language was not English were excused from the study. In the current study, approximately 30% of the students, including Vietnamese and Indochinese students, were recent arrivals in the Unites States. Another 30% of the students came from homes where Spanish was either the primary language or used in addition to English. As a result, most of the students in the study had potential problems in understanding the vocabulary or meaning of the questions, due to their unfamiliarity with English.

Although some of the students were enrolled in elective science courses and were probably reading at or about their grade level, many of the students in the required freshman or sophomore classes had lower reading levels. The reading level of the sample could be presumed lower than other high schools in the area (K. Lyter, personal communication, January, 1985). Diminished reading levels, combined with a narrow time frame for questionnaire completion, probably yielded varied responses unfavorably affecting the reliability of the results.

These reliability results indicated that the HWT did not reliably measure the dimensions of Type A in an ethnically diverse sample. The behaviors described in the tool are those familiar to the culture of the United States. Some of the scales used may reflect clearly unacceptable or unfamiliar behaviors in another cultural group. For example, it is unlikely that fighting, anger, and hard-driving behavior have the same cultural value in Asian and African American groups. Thus, a high or low score on the scale may not indicate personality characteristics, but a response based on the values of the student's cultural group.

Correlation Coefficients

Pearson's Product-Moment Correlation Coefficients were calculated for correlations between variables, as shown in Table 5. Overall ladder scores directly indicated Type A or Type B behavior. A high ladder score indicated Type A behavior, while a low score indicated Type B behavior. Ethnicity was converted to five dummy variables. In terms of simple correlations, physical activity had the most significant contribution to the score on the HWT (the ladder score) at levels of

Table 5

Correlation Coefficients: Total Score on Hunter–Wolf Tool (ladder score) in relation to RFQ

	Ladder Score	Age	Gender	Caucasian	Hispanic	Black	Indochinese	Vietnamese	Family Illness	Drug Use	Physical Activity	Smoking	Family Stress	School Stress
Age	0.005	x												
Gender	0.100*	–0.073*	x											
Caucasian	–0.006	–0.059	0.002	x										
Hispanic	0.083*	–0.091*	0.049	–0.346	x									
Black	–0.047	–0.090	0.059	–0.190	–0.272	x								
Indochinese	0.095*	0.114	–0.017	–0.215	–0.308	–0.169	x							
Vietnamese	–0.093*	0.145	–0.068*	–0.208	–0.298	–0.164	–0.186	x						
Family illness	–0.004	–0.006	–0.116	–0.164	–0.072*	–0.074	–0.139	0.227	x					
Drug Use	0.042	–0.055	–0.036	0.033	0.041	–0.008	–0.102	–0.007	0.044	x				
Physical activity	0.101*	0.292*	0.013	0.069	–0.052	0.065	–0.028	–0.033	–0.102	–0.004	x			
Smoking	–0.083*	0.031	0.033	0.070	0.035	–0.025	–0.056	–0.066	–0.082	–0.082	–0.034	x		
Family stress	0.085*	0.022	–0.155*	–0.067*	0.044	0.007	0.085	–0.033	0.122	–0.034	–0.003	–0.068	x	
School stress	0.031	–0.078	–0.035	–0.030	0.049	0.041	–0.041	–0.030	–0.004	–0.023	–0.056	–0.070	0.355	x

*p ≤0.05

$p \leq 0.05$. There was a positive correlation between low physical activity and Type A behavior ($r = 0.10$, $p \leq 0.05$). There was also a positive correlation between female gender and Type A behavior at the level of $r = 0.10$, $p \leq 0.05$. Indochinese students had a positive correlation with Type A at the level of $r = 0.095$, $p \leq 0.05$. Vietnamese students had a negative correlation with Type A behavior at the level of $r = 0.093$, $p \leq 0.05$. Hispanic students had a positive correlation with Type A behavior at the level of $r = 0.083$, $p \leq 0.05$. Smokers showed a negative correlation with Type A behavior at the level of $r = 0.083$, $p \leq 0.05$. A high level of family stress correlated with a high Type A score at the level of $r = 0.085$, $p \leq 0.05$. In correlations between independent variables, family stress correlated positively with school stress at the level of $r = 0.355$, $p \leq 0.05$. Older students were less physically active at the level of $r = 0.292$, $p \leq 0.05$.

Significant Type A factors reported by this sample include low physical activity, female gender, Indochinese or Hispanic ethnicity, and high family stress. With the exception of family stress level, the risk factors mentioned are opposite of those associated with Type A behavior in past studies in more ethnically homogeneous samples.

Regression Analyses

A multiple regression was calculated using all the variables to predict the Hunter–Wolf score. The multiple r of 0.27 [$F(13,433)$] indicated that the independent variables (risk factors) accounted for only 7% of the variance (r^2) of Type A and Type B scores on the HWT.

Table 6 lists the beta weights and t values for the independent variables. Beta weights indicate how well a specific variable can predict scores on the HWT in conjunction with the other variables. Only ethnicity, gender, and physical activity had significant t values indicating predictive value. Some variables did not correlate with the overall ladder score, but when taken with other variables, could predict overall score. Caucasian ethnicity had a low r of −0.006, but a beta weight of 0.25 and significant t score of 0.029, indicating that it added to predictability of ladder score when taken with other variables. Significant t values of 0.05 or below indicated that Indochinese, Caucasian, and Hispanic ethnicity were the most significant predictors of Type A scores. Gender and physical activity also had significant beta weights, indicating ability to predict overall Type A scores. Ethnicity and physical activity (usually culturally determined) contributed significantly to Type A predictability, which indicates a cultural component to Type A.

A step−wise regression was calculated to determine the amount that each variable added to the prediction of the overall Type A score. The variables that constituted ethnicity were entered as a package as the most predictive unit based on the beta weights and significant t. Physical activity was then added because it significantly added to the predictability of the Type A score. An increasing r value from 0.195 to 0.222 indicated that physical activity added slightly to the predictability of Type A scores when used in conjunction with ethnicity. No other variables were able to account for a significant amount of variance in the total HWT scores.

Table 6

Beta Weights and Significant t for Selected Variables (N = 447)

Variable	Beta	t	Significance of t
Age	-0.013	-0.249	0.804
Gender	0.103	2.160	0.031*
Caucasiaan	0.248	2.202	0.028*
Hispanic	0.354	2.711	0.007*
Black	0.160	1.606	0.109
Indochinese	0.317	2.944	0.003*
Vietnamese	0.160	1.523	0.129
Family illness	-9.1 E-04	-0.018	0.985
Drug use	0.546	1.160	0.247
Physical activity	0.107	2.176	0.030*
Smoking	-0.697	-1.477	0.141
Family stress	0.073	1.420	0.156
School stress	0.012	0.234	0.815

*p <.05

Summary

The research questions for this study focused on the relationship between Type A behavior and coronary risk factors. The original research questions addressed the relationship between high Type A behavior as measured by the HWT and the following controllable risk factors: (a) smoking, (b) sympathomimetric drug use, (c) stress, (d) weight, and (e) physical activity. Noncontrollable risk factors (age, gender, ethnicity) were also analyzed in relation to high scores on the HWT. The analysis indicated a correlation between certain of these risk factors (ethnicity, gender, physical activity), and high scores on the HWT measuring Type A behavior. Smoking, sympathomimetic drug use, stress, and weight were not correlated with high Type A scores on the HWT. However, a low reliability score indicated that Type A behavior was not accurately measured by the HWT.

Chapter 5

CONCLUSIONS

The strengths of this study lie in the size of the sample and in the unique composition of the sample. A recent (1991) brief review of the literature indicates that the ethnic groups and ages in the present study have not been similarly studied with either the HWT or any of the other tools for measuring Type A behavior in adolescents. Moreover, in adult studies, the samples continue to be American or other Western European cultures. The absence of similar studies and the limitations of the current study offer some possibilities for further research.

Due to the low reliability scores on the HWT for the sample, one may conclude that the rest of the data permutations yield little usable information. However, the size and unique composition of the sample allow for suggestions for further tool refinement and adapted methodologies when working with nonWestern cultures.

To test the hypothesis that students with English as a second language perform poorly on the HWT, the tool should be tested on a group of urban high school students with good English skills. To refine the present sample, Black and Caucasian students' scores may be evaluated separately for reliability (assuming their first language to be English). Another approach might be to translate the tool directly into Spanish for students who are bilingual or partially bilingual and compare reliability scores between the Spanish and English versions.

Persons from differing cultural backgrounds might better be screened for Type A behavior using tools that rely less on written comprehension of English. While some of the interview techniques may not improve on reaching a person with very limited English, a researcher would be much more likely to control the content of the interview and be sure the subject grasped the question, whether by using simpler English, body or hand language, pictures, or a combination. Nurses who work with clients from other cultures could be trained in the interview process. The formation of a relationship between nurse and client would allow a more accurate interpretation of the client's perceptions and behaviors.

Cultural components of behavior are very difficult to control in a sample such as the one in this study. Few studies have been done on the components of Type A behavior in the Hispanic or Asian American subcultures. The relative absence of coronary artery disease in some subcultures may or may not be related to the presence of Type A behavior as a cultural norm. American cultural values place strong positive connotations on behaviors such as competitiveness, efficiency, standing up for one's rights, punctuality, leadership, and effort. The tendency for Hispanic and Indochinese students to be more Type A in this sample may have little to do with heart disease, but may relate to gang behaviors, drug use, or inability to read English. Hispanic or IndoChinese students may also be assimilating American cultural values more rapidly.

Studies that measure culturally sensitive indicators of coronary prone personalities could be designed for different ethnic groups. The same groundwork that was laid by retrospective studies of Caucasian middle class men needs to be replicated in adults of

all ethnic groups to reflect changing demographics. Only then will it be possible to determine if enculturation into the American value system produces Type A behavior or if there are measurable Type A characteristics in other cultural norms. Similarly, cultures with a lower incidence of heart disease or a lower incidence of Type A behavior need to be examined for the components of a positive or noncoronary mindset. This positive mindset may be identified and quantified as something other than Type B. Nurses would be able to incorporate components of the noncoronary mindset into health screening profiles or design prevention projects aimed at specific groups.

To proceed further, longitudinal studies could be instituted in which recent arrivals to the American culture are studied as they assimilate values other than their own. If Type A behavior becomes more pronounced the longer a person is in America, then one could determine which of the components of Type A is the strongest or earliest adopted. It is very likely that some of the Type A characteristics are necessary for survival in American culture.

It is not surprising that ethnicity and gender produce some of the strongest predictions of Type A behavior in adolescents. Most of the lessons learned about function in society are learned in a family setting and begin as soon as children are able to accept stimuli. Thus, efforts at preventing the genesis of Type A behavior or of unhealthy coping styles may be aimed at families. Just as parents are more aware of cholesterol levels in young children, they might also be alerted to the Type A behavior characteristics and cultural messages that reinforce the behaviors.

The other variable that produced strong prediction of Type A behavior was physical activity. Older students engaged in physical activity less than younger students, probably due to the elimination of physical education as a requirement after the sophomore year. Cultural components of physical activity are pronounced and have an influence on behavior type. An interesting avenue for further research would be exploring the physical activity beliefs of various cultures and relating them to Type A behavior or prevalence of heart disease.

In summary, nursing as a discipline is uniquely suited to continuing and furthering research into behavior types and risk factors associated with coronary artery disease. Nurses encounter clients at every level on the continuum of heart disease from prevention, through acute tertiary care, and rehabilitation. Nursing's history of exposure to the client's daily activities and the use of the nursing process to solve problems related to healthy living throughout the life cycle enable nurses to create and implement programs to address the needs for behavior and lifestyle changes.

REFERENCES

REFERENCES

American Heart Association (1984). Heart Facts 1984. Dallas, TX.

American Heart Association (1984). [High School Blood Pressure Screening Survey Scores.] Unpublished raw data.

American Heart Association (1990). [High School Blood Pressure Screening Program Scores.] Unpublished raw data.

Arlow, J. (1945). Identification mechanisms in coronary occlusion. Psychosomatic Medicine, 7, 195.

Berenson, G., McMahan, C., Voors, A., Webber, L., Srinivasan, S., Frank. G., Foster, T., Blonde, C. (1980). Cardiovascular risk factors in children: The early natural history of atherosclerosis and essential hypertension. New York: Oxford University Press.

Blumenthal, J.A., Kong, Y., and Rosenmann, R.J. (1978). Type A behavior and angiographically documented coronary disease. In Dembroski et al. (Eds.), Coronary prone behavior (p. 87). New York: Springer-Veriag.

Blumenthal, J.A., Williams, R.B., Kong, Y., Schanberg, S.M., & Thompson, L.W. (1978). Type A behavior pattern & coronary atherosclerosis. Circulation, 58, 634-639.

Bortner, R.W., & Rosenman, R.H. (1967). The measurement of pattern A behavior. Journal of Chronic Diseases, 20, 525-533.

Bortner, R.W., Rosenman, R.H., & Friedman, M. (1970). Familial similarity in pattern A behavior: Fathers & sons. Journal of Chronic Diseases, 23–39.

Brand, R.J., Rosenman, R.H., & Sholtz, R.I. (1976). Multivariate predictions of coronary heart disease in the Western Collaborative Group Study compared to the findings of the Framingham Study. Circulation, 53, 348–355.

Burnham, M.A., Pennebaker, J.W., & Glass, D.D. (1975). Time consciousness, achievement striving and the Type A coronary prone behavior pattern. Journal of Abnormal Psychology, 84, 76–79.

Butensky, A., Faralli, V., Hebner, D., & Waldron, I. (1976). Elements of coronary prone behavior in children and teenagers. Journal of Psychosomatic Medicine, 20(5), 439–444.

Dembroski, T.M. (1978). Section Summary: Assessment of coronary prone behavior. In Dembroski, T.M., Weiss, S.M., Shields, J.L., Haynes, S.G., & Feinleib, M. (Eds.), Coronary prone behavior. New York: Springer–Veriag.

Dembroski, T.M., MacDougall, J.M., & Shields, J.L., Pettitte, J., & Lushene, R. (1977). Physiologic reactions to social challenge in persons evidencing the Type A coronary prone behavior pattern. Journal of Human Stress, 3(3), 2–9.

Dunbar, H.F. (1942). Symposium on social psychiatry; relationship between anxiety states and organic disease. Clinics, 1, 979–908.

Frank, K.A., Heller, S.S., Kornfeld, D.S., Sporn, A., & Weiss, M. (1978). Type A behavior pattern and coronary angiographic findings. Journal of American Medical Association, 240(8), 761–763.

Friedman, M. (1978). Type A behavior: Its possible relationship to pathogenic processes responsible for coronary heart disease. In Dembroski, T., Weiss, S., Shields, J., Haynes, S., & Feinleib, M. (Eds.), Coronary prone behavior. New York: Springer-Veriag.

Friedman, M., Byers, S., Diamant, F., & Rosenman, R.H. (1975). Plasma catecholamine response of coronary-prone subjects (Type A) to a specific challenge. Metabolism, 24, 205-210.

Friedman, M., & Rosenman, R.H. (1959). Association of specific overt behavior pattern with blood and cardiovascular findings. Journal of American Medical Association, 169, 1286-1296.

Friedman, M., Rosenman, R.H., & Byers, S. (1964). Serum lipids and conjunctural circulation after fat ingestion in men exhibiting Type A behavior pattern. Circulation, 29, 874-886.

Hall, Diane (1982). The assessment of Type A behavior in children. Health Education, 29, 55-57.

Hayes, S.G., Levins, S., Scotch, N., Feinleiv, M., & Kannel, W.B. (1978). The relationship of psychosocial factors to coronary heart disease in the Framingham Study I: Methods risk factors. American Journal of Epidemiology, 107, 362-383.

Herd, J.A. (1978). Physiological correlation of coronary prone behavior. In Dembroski et al (Eds.), Coronary prone behavior (pp. 129-139). New York: Springer-Veriag.

Hunter, S.M., Wolf, T.M., Sklov, M.C., Webber, L.S., Watson, R.M., & Berenson, G.S. (1982). Type A coronary prone behavior pattern and cardiovascular risk factor variables in children and adolescents: The Bogalusa Heart Study. Journal of Chronic Diseases, 35, 613–621.

Jenkins, C.D. (1976). Recent evidence supporting psychologic and social risk factors for coronary disease. New England Journal of Medicine, 294, 987–994, 1033–1038.

Jenkins, C.D., Rosenman, R.H., & Cleveland, G.C. (1971). Psychological and social precursors of coronary artery disease. New England Journal of Medicine, 284 (6), 307.

Jenkins, C.D., Rosenman, R.H., & Friedman, M. (1967). Development of an objective psychological test for the determination of the coronary prone behavior pattern in employed men. Journal of Chronic Diseases, 20, 371–379.

Jenkins, C.D., Rosenman, R.H., & Zyzanski, S.J. (1968). Cigarette smoking: Its relationship to coronary heart diseases and related risk factors in the Western Collaborative Group Study. Circulation, 38, 1140–1155.

Jenkins, C.D., Rosenman, R.H., & Zyzanski, S.J. (1973). Predicting coronary artery disease with test scores for behavior Type A. Circulation, 48(4), 23–73.

Johnson, C.C., Hunter, S.M., Amos, C.I., Elder, S.T., & Berenson, G.S. (1989). Cigarette smoking, alcohol, and oral ocntraceptive use by Type A adolescents: The Bogalusa Heart Study. Journal of Behavioral Medicine, 12(1), 13–24.

Kannell, W.B., Castelli, W.P., & McNamara, P.M. (1967). The coronary profile: Twelve year follow up in the Framingham Study. Journal of Occupational Medicine, 9, 611-619.

Kittel, F., Kornitz, E.M., Zyzanski, S.J., Jenkins, C.D., Rustin, R.M., & Degre, C. (1978). Two methods of assessing Type A coronary prone behavior pattern. Journal of Chronic Diseases, 31(3), 147-155.

Lazarus, R.S. (1984). Stress, apraisal and coping. New York: Springer Publishing.

Matthews, K.S., & Angulo, J. (1980). Measurement of the Type A behavior pattern in children: Assessment of children's competitiveness, impatience, anger, and aggression. Child Development, 51, 466-475.

Matthews, K.A., Manuck, S.B., Stoney, C.M., Rakaczky, C.J., McCann, B.S., Saab, P.G., Woodall, K.L., Block, D.R., Visintainer, P.F., & Engebretson, T.O. (1988). Familial aggregation of blood pressure and heart rate responses during behavioral stress. Psychosomatic Medicine, 50(4), 341-352.

Neufeld, R. (1974). Dimensionality of subjective response to a selection of complex aversive stimuli. Canadian Journal of Behavioral Science, 6(3), 258-267.

Neufeld, R., Davison, P. (1973). Semantic dimensionality of subjective stress scales. Psychological Reports, 33(3), 885-886.

Ploeger, B. (1986). Smoking Behavior in Adolescents. Unpublished manuscript, San Jose State University, San Jose, California.

Rosenman, R., Brand, R., Jenkins, C., Friedman, M., Strauss, R., & Wurm, M. (1975). Coronary heart disease in the Western Collaborative Group Study: Final

follow up of 8–1/2 years. Journal of American Medical Association, 233, 872–877.

Rosenman, R.H., Brand, R.J., & Sholtz, R.I. (1976). Multivariate prediction of coronary heart disease during 8.5 years follow up in the Western Collaborative Group Study. American Journal of Cardiology, 37, 903–910.

Rosenman, R.H., Friedman, M., Strauss, R., Wurm, M., Kositchek, R., Hahn, W., & Werthessen, N.T. (1964). A predictive study of coronary heart disease: The Western Collaborative Group Study. Journal of American Medical Association, 189, 15–22.

Siegel, J.M., Matthews, K.A., & Leitch, C.J. (1983). Blood pressure variability and the Type A behavior pattern in adolescents. Journal of Psychosomatic Research, 27 (4), 265–272.

Stamler, R. (1975). Primary prevention of sudden coronary death. Circulation, 52(6), 258–279.

Suinn, R.M. (1978). The coronary prone behavior pattern: A behavioral approach to intervention. In Dembroski et al. (Eds.), Coronary prone behavior (231–236). New York: Springer–Veriag.

Williams, R., Haney, T., Lee, K., Kong, Y., Blumenthal, J.A., & Whalen, R.E. (1980). Type A behavior, hostility, & coronary atherosclerosis. Psychosomatic Medicine, 42, 539–549.

Wolf, T., Hunter, S., & Webber, L. (1979). Psychosocial measures and cardiovascular risk factors in children and adolescents. Journal of Psychology, 101, 139–146.

Wolf, T., Hunter, S., & Webber, L., & Berenson, G. (1981). Self-concept, locus of control, goal blockage and coronary prone behavior pattern in children and adolescents: Bogalusa Heart Study. Journal of General Psychology, 105, 13-26.

Woodall, K.L., & Matthews, K.A. (1989). Familial environment associated with Type A behaviors and psychophysiological responses to stress in children. Health Psychology, 8(4), 403-426.

Zyzanski, S.J., Jenkins, C.D., Ryan, T.J., Flessas, A., & Everist, M. (1976). Psychological correlates of coronary angiographic findings. Archives of Internal Medicine, 136(11), 1234-1237.

BIBLIOGRAPHY

BIBLIOGRAPHY

American Heart Association, Santa Clara County Chapter (1983). Santa Clara County high school student's risk factor questionnaire. San Jose, CA.

Dumchius, S.V. (1988). The behavior characteristics of adolescents with increased arterial blood perssure. Kardiologiia, 28(3), 24–26.

Groll–Knapp, E., Kundl, M., Pakesch, G., Rasinger, E., & Tutsch, G. (1989). Prevalence of a Type A behavior pattern (coronary prone behavior pattern) in the Vienna population. Wein Klin Wochenschr, 101 (17), 587–595.

Heilbrun, A.B., Jr., & Friedberg, E.B. (1988). Type A personality, self–control, and vulnerability to stress. Journal of Personal Assessment, 52(3), 420–433.

Heine, H., Weiss, M. (1988). Behavior, personality and cardiovascular diseases. Kardiologiia, 28(3), 16–19.

Randall, T., Crabtree, D., & Antrim, L. (1989). Relations between personality measures and physiological reactivity using a perceptual motor challenge. Perception Motor Skills, 69, 944–946.

Sallis, J.F., Dimsdale, J.E., & Caine, C. (1988). Blood pressure reactivity in children. Journal of Psychosomatic Research, 32(1), 1–12.

Suls, J., & Wan, C.K. (1989). The relation between Type A behavior and chronic emotional distress: A meta–analysis. Journal of Personality and Social Psychology, 57(3), 503–512.

Wrzesniewski, K., Forgays, D.G., & Bonafuto, P. (1990). Measurement of the Type A behavior pattern in adolescents and young adults: Cross-cultural development of AATAB. Journal of Behavioral Medicine, 13 (2), 111-135.

APPENDIX A

Consent Form

CONSENT FORM

I agree to participate in the study conducted by _____ at _____. I understand she is a student at San Jose State University and that by participating in this study, I will help her complete some of the requirements for a Master's Degree in Nursing. I am aware that the purpose of the study is to find out how high school students' lifestyles and personalities affect heart disease. I understand that any information I give is absolutely secret and cannot be traced back to me. I am aware that I will fill out two questionnaires.

_____

Student Signature

APPENDIX B

Hunter–Wolf Tool

APPENDIX C

Risk Factors Questionnaire

HEART STUDY
RISK FACTORS QUESTIONNAIRE

CIRCLE THE ANSWERS AS THEY APPLY TO YOU
ALL OF YOUR ANSWERS WILL BE KEPT SECRET

1. Age (on your last birthday): 14 15 16 17 18 over 18

2. Sex: Male Female

3. Ethnic Group: White
   Hispanic
   Black
   Indo-Chinese
   Vietnamese
   Native American (American Indian)

4. Circle any of these that have happened in your family (parents, grandparents, aunts, uncles):

   Heart attack
   Stroke
   Diabetes
   High blood pressure

5. Circle any of these that you use once a week or more:

   Diet pills
   Birth control pills
   Cocaine ("coke," "snow")
   Cold medicines
   Amphetamines ("uppers")

6. Are you enrolled in high school P.E. classes? Yes_____ No_____

   IF THE ANSWER TO IS YES, PLEASE FILL OUT THIS QUESTION ONLY!

   How often do you get dressed for class?

   Once a week
   Twice a week
   3 times/week
   4 times/week
   5 times/week
   Never

   IF THE ANSWER IS NO, PLEASE FILL OUT THIS QUESTION ONLY!

   Circle any of these activities that you perform 3 times a week or more often:

   After-school sports
   Swimming
   Running
   Dance of aerobics class
   Bicycling
   Other _____

7. How often do you smoke cigarettes?

   Every day
   5-6 days a week
   3-4 days a week
   2 times a week or less
   Never

8. Your approximate Height_____ Weight_____

9. How would you rate the level of stress* you feel in your family?

   Very high
   High
   Moderate
   Little
   None

10. How would you rate the level of stress* you feel at school?

Very high
High
Moderate
Little
None

*IF YOU DO NOT UNDERSTAND WHAT IS MEANT BY "STRESS" IN QUESTIONS 9 AND 10, PLEASE ASK THE PERSON WHO IS GIVING YOU THIS QUESTIONNAIRE TO READ A LIST OF WORDS THAT HAVE SIMILAR MEANINGS.

THANK YOU VERY MUCH FOR PARTICIPATING IN THIS STUDY. YOU MAY HAND IN YOUR QUESTIONNAIRES WHEN YOU ARE FINISHED WITH THIS SECTION.

APPENDIX D

Letter to School

November 1, 1984

Dr. John Hernandez
Yerba Buena High School
1855 Lucretia
San Jose, California 95122

Dear Dr. Hernandez:

This letter is to confirm that I have your consent to analyze student questionaire data generated from your annual hypertension clinic. This data will be used as part of a research project applying to a master's thesis in nursing at San JOse State University.

Thank you very much

Jane K. Addington

Jane K. Addington R. N.

I consent to allow Jane K. Addington to gather and analyze data from student questionaires collected at Yerba Buena High School.

_____

APPENDIX E

Letter Giving Permission to Use Hunter–Wolf Type A Measure

SCHOOL OF MEDICINE IN NEW ORLEANS
Louisiana State University
Medical Center
1542 Tulane Avenue
New Orleans, LA 70112-2822
Telephone: (504) 568-5845

Department of Medicine
(NRDC-A)

October 22, 1984

Ms. Jane Kochka Addington
1472 Lincoln Avenue
San Jose, California 95125

Dear Ms. Addington:

Thank you for enquiring about our Hunter-Wolf Type A measure. You are free to use it; however, we ask that you send us age, race and sex distributions with regards to it. We are trying to establish norms. I have included the protocol and reprints concerning selected findings. If you have any questions, please feel free to call.

Sincerely yours,

Saundra MacD. Hunter, Ph.D.
Associate Professor

SMacDH/prc

Enc.

APPENDIX F

Human Subjects Project Proposal Review

Committee for the Protection of Human Subjects
Project Proposal Review

We, the undersigned members of the San Jose State University Committee for the Protection of Human Subjects, have reviewed the following proposal submitted to the Committee on 11/26/84 by:

Principal Investigator Jane Kochka Addinton

Project Title Type a Behavior and Controllable coronary artery disease risk factors in adolescents

We recommend the following action (indicate one):

1. Approved for clearance as involving minimal risk to human subjects. ☐
2. Approved for clearance with risk to human subjects. ☐
3. Approved for clearance when the following conditions are met: ☐

_____

_____

4. Return to principal investigator for following reasons: ☐

_____

_____

Approved with minimal risk ☑ Approved with risk ☐ Not Approved* ☐

Hector G Sa 12/11/84
Signature Date

Approved with minimal risk ☐ Approved with risk ☐ Not Approved* ☐

Signature Date

Approved with minimal risk ☐ Approved with risk ☐ Not Approved* ☐

Signature Date

*Return to OSP for full CPHS review.

(OVER ------->)

Committee for the Protection of Human Subjects
Project Proposal Review

We, the undersigned members of the San Jose State University Committee for the Protection of Human Subjects, have reviewed the following proposal submitted to the Committee on 11/26/84 by:

Principal Investigator Jane Kochka Addinton

Project Title Type e Behavior and Controllable coronary artery disease risk factors in adolescents

We recommend the following action (indicate one):

1. Approved for clearance as involving minimal risk to human subjects. ☐
2. Approved for clearance with risk to human subjects. ☐
3. Approved for clearance when the following conditions are met: ☐

_____

_____

4. Return to principal investigator for following reasons: ☐

_____

_____

12/1/84

Approved with minimal risk ☒ Approved with risk ☐ Not Approved* ☐

Signature Date

Dr. John Moore

Approved with minimal risk ☐ Approved with risk ☐ Not Approved* ☐

Signature Date

Approved with minimal risk ☐ Approved with risk ☐ Not Approved* ☐

Signature Date

*Return to OSP for full CPHS review.

(OVER ------->)

Committee for the Protection of Human Subjects
Project Proposal Review

We, the undersigned members of the San Jose State University Committee for the Protection of Human Subjects, have reviewed the following proposal submitted to the Committee on 11/26/84 by:

Principal Investigator Jane Kochka Addinton

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We recommend the following action (indicate one):

1. Approved for clearance as involving minimal risk to human subjects. ☐
2. Approved for clearance with risk to human subjects. ☐
3. Approved for clearance when the following conditions are met: ☐

_____

_____

4. Return to principal investigator for following reasons: ☐

_____

_____

Approved with minimal risk ☑ Approved with risk ☐ Not Approved* ☐

Signature Jane K. Addinton Date 11/9/84

Approved with minimal risk ☐ Approved with risk ☐ Not Approved* ☐

Signature Date

Approved with minimal risk ☐ Approved with risk ☐ Not Approved* ☐

Signature Date

*Return to OSP for full CPHS review.

(OVER ——————>)

APPENDIX G

Information from Teacher to Participating Students

INTRODUCTION

YOU ARE TAKING PART IN A VERY IMPORTANT SCIENTIFIC STUDY AND WE NEED YOUR COOPERATION. WE NOT WANT YOU TO ANSWER SOME QUESTIONS. THIS IS NOT A TEST. THERE ARE NO RIGHT OR WRONG ANSWERS AND THE RESULTS WILL NOT AFFECT YOUR SCHOOL GRADES. IT IS VERY IMPORTANT THAT YOU ANSWER THE QUESTIONS TRUTHFULLY. EVERY ANSWER THAT YOU GIVE IS KEPT A SECRET. NO ONE WILL KNOW HOW YOU ANSWERED THESE QUESTIONS, NOT YOUR PARENTS, YOUR TEACHERS, OR YOUR FRIENDS. PLEASE LISTEN CAREFULLY WHILE I GIVE YOU SOME INSTRUCTIONS. FOLLOW ALONG WITH ME WHILE I READ THEM TO YOU. DO NOT TALK TO YOUR FRIENDS WHILE ANSWERING THE QUESTIONS. IF YOU HAVE ANY QUESTIONS, RAISE YOUR HAND. WHEN YOU FINISH EACH SECTION, PUT YOUR PENCIL DOWN AND WAIT TILL EVERYONE IS FINISHED. THEN, YOU CAN PUT YOUR QUESTIONNAIRE IN THE BOX MARKED QUESTIONNAIRES.

APPENDIX H

Synonym List for Participants

SYNONYM LIST

activities	things to do
angry	mad
argue	disagree, tell somebody they are wrong
attitudes	the way you look at things
believe	think, accept
blame myself	think it's your fault
bored	tired of, not interested
bothers	disturbs, upsets, annoys
cheerful	happy
chosen	selected, picked
confidential	private, secret
control	power, to be in charge of
difficult	hard
easy-going	gentle, easy to make happy
education	learning, amount of school
effort	work, trouble
exercise	do things, activity
expect	intend, plan, want
fidget	can't sit still
the following	what comes next
frightened	afraid, scared
hard-driving	hard-working, energetic
health	condition, if you are sick or well
hobbies	things you like to do in your free time
imagine	pretend, make believe
immediately	right away, right now
important	outstanding

independent	on your own, don't need help
indicates	shows
interest	caring, what I like to do
leader	head, person in charge
member	part
nervous	upset
obedient	mind, do what you are told
occasions	times
opinions	how you feel or think about things
pep	energy
prefer	want most
problem	difficulty, issue
properly:	in the right way, correctly
related:	has something to do with
relaxation:	rest, take it easy, playtime
remember:	think back
resist:	don't give in
responsible:	in charge
rushed:	in a hurry
satisfied:	pleased
self-control:	will power, make myself do what I need to do
solution:	answer
solve:	find answer, work out
sometimes:	every now and then
statement:	sentence, problem
temper:	mood, feeling quick tempered - get mad easily
temptation:	things you aren't supposed to do but want to do
tend:	seem to
tense:	nervous, upset

unpopular:	uncared for, not liked
upset:	unhappy
usually:	most of the time, often, regularly
volunteer:	offer; do things without getting paid
well-behaved:	act like I'm supposed to

SYNONYM LIST FOR THE YERBA BUENA HEART STUDY RISK FACTOR QUESTIONNAIRES

heart attack	myocardial infarction, coronary, MI
stroke	blood clot to the brain, aneurysm, burst blood vessel in the brain, cerebral hemorrhage, CVA, cerebral vascular accident
diabetes	sugar diabetes, DKA, insulin dependent diabetes, juvenile diabetes, adult–onset diabetes
high blood pressure	hypertension, high blood
cold medicines	Contac, Nyquil, Actifed, Pseudophed, cough syrups, antihistamines
stress	feeling anxious or worried a large amount of the time, upset, tense, uptight, feeling like lots of pressure is on you